International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Relationship Between FDI And India's Foreign Trade: A Cointegration and VECM Approach

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Abstract:
Foreign capital inflows have emerged as a powerful tool for transferring capital and technology from other economies, especially developed countries. Globalization has made way for international business to cross borders. Foreign Institutional Investor and Foreign Direct Investment (FDI) are two modes of foreign investment and FDI is one of the best routes to invest across the border. India has also become an attractive destination for investment due to immense growth potential. The whole world has seen the role of foreign investment in acting as a bridge to link the gap between investment and savings. It helps in maintaining transparency among different countries and promotes bilateral trade between the countries. This paper focuses on analyzing the trend of FDIs and exports along with the relationship between exports and FDI with the help of Johansen Cointegration and Vector error correction model (VECM)

Keywords: FDI, Export, Cointegration, VECM

1. INTRODUCTION

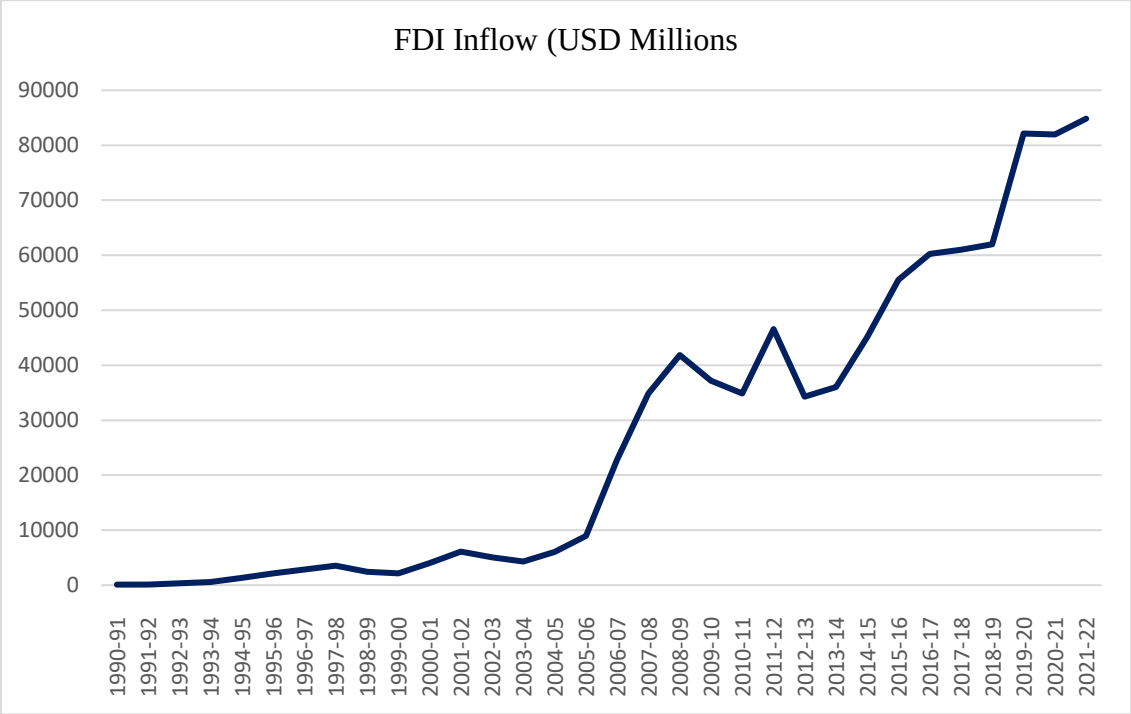
FDI is appeared as an essential useful resource for accelerating the industrial improvement for developing countries, as it brings a package of capital, technology and competencies. India remains a bright spot inside the international economic system, although a low has been recorded within the government's modern day figures for foreign direct Investment (FDI). The decline in FDI can be attributed to international headwinds consisting of the Russia-Ukraine conflict, global recessionary pressures, spillover of the COVID-19 pandemic and other monetary uncertainties.

Yet, the Indian market is prime for international corporations as they strategize the diversification of their supply chains past China. India has numerous boom elements that preserve to create potentialities for greenfield and brownfield funding – a huge hard work marketplace, enabling policy environment, and expanding virtual economic system. In terms of intake growth, this has been boosted by way of gradually growing disposable incomes and the economic upward push of non-metropolitan tier-two and tier-three towns.

Improvement of economic system is immediately proportional to the exports specially for developing countries like India. Low exports cause decrease foreign exchange reserves that adversely affect the buying capacity of the country within the global market. Export is a constituent of demand and more exports consequences in upward push of demand and as a result economic boom, India's exports (products and services mixed) in June 2022 are envisioned to be USD 64.91 Billion, displaying an effective growth of 22.9 percent. The total exports (products and services combined) in the 1st quarter of FY 2022-23 (April-June 2022) are anticipated to be USD 189.93 Billion, showing a fantastic boom of 25.16 percent.

The overall imports in June 2022 are estimated to be USD 82.42 Billion, displaying a positive increase of 55%. In the first quarter of the FY 2022-23, the exports are estimated to be USD 235.11 Billion, exhibiting a wonderful boom of 49.4 percent. In figure 1, it is clearly visible that an increasing curve represents FDI inflows since 1990-1991.

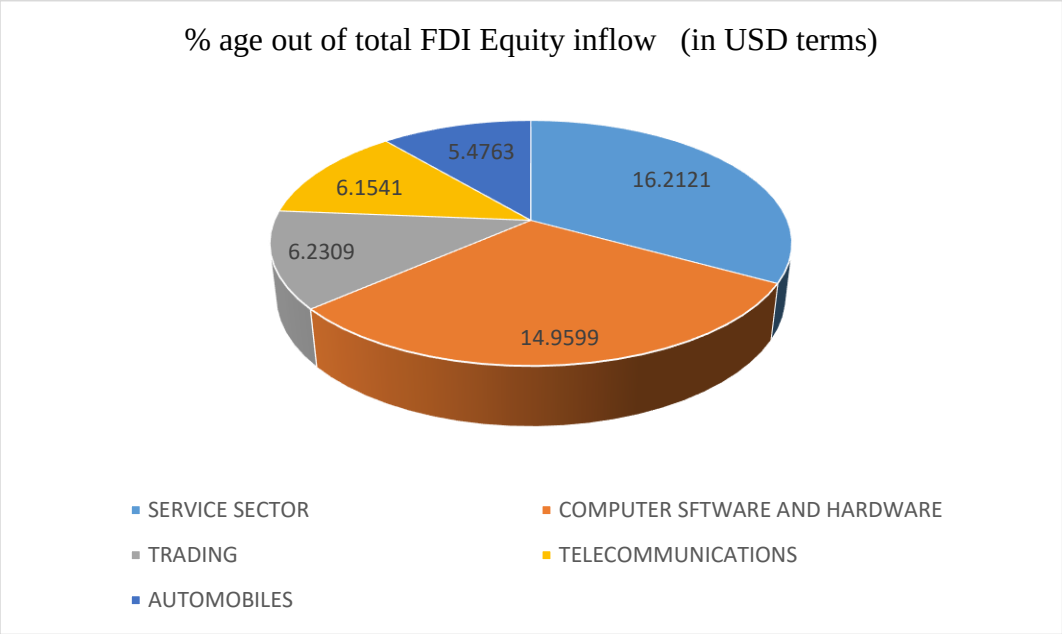
Figure 1- Trend in FDI Inflows since 1990-1991



Source: compiled from dpiit.gov.in/publications/fdi-statistics

Service sector is leading to get highest FDI (16.21% of total FDI inflows) since 2000 followed by Trading and Telecommunications sector. As far as manufacturing sector is concerned, FDI equity inflow has been boosted by 76% in the FY 2021-22, compared to the last financial year.

Figure 2- Top 5 sectors attracting FDI since 2000-2001



Source: compiled from dpiit.gov.in/publications/fdi-statistics

Past studies show that FDI inflows compliment the export performance for developing economies and very less effective for lower income countries (Sahu and Dash 2022).

2. A BRIEF REVIEW OF LITERATURE:

A number of studies carried out in different countries to evaluate a causal relationship among FDI, exports and other economic indicators.

Sharma Kishor (2000) found that foreign investment appears to have statistically no significant impact on India's export performance in the time duration of 1970-1998.

Manop, Holger, and Morrissey (2006) conclude that fluctuations in exchange rates influence foreign investors to invest in emerging countries. They show interest in investment when exchange rate falls and expected devaluation postpones investment

Chen, Kun-Ming, Rau Hsiu and Lin Chia-Ching (2006) demonstrated a negative impact on a firm's outward FDI due to exchange rate uncertainty while the depreciation of a host country's currency tends to stimulate the outward FDI activity of cost-oriented firms, it does tend to deter the outward FDI activity of market-oriented firms.

Mathai K. (2005) tested a relationship among FDI inflow and output, labour productivity and export. He found that there is a very moderate relation established by the FDI into the sectors. He further advised that it is necessary to open up export-oriented sectors in order to achieve higher economic growth.

Barua R. (2013) concluded strong positive correlation between FDI inflows in India and total exports and 1% increase in FDI increases export by 4.7%. To grow at a faster pace increase in export is necessary and India should keep on attracting foreign investment in order to achieve a rapid growth in economy.

Susan Jacob (2012) pointed out the volatility of REER in early reform period regarding appreciation and depreciation. In early 1990s, there was a significant relationship between REER and exports, with the depreciation in REER export had increased. However, in 2000s it became more stable and continuously appreciated until 2007 and REER appreciation had not shown any significant relationship with exports. He advised that a better evaluation of the impact of REER on export could be done only after analysis of major exports sector separately.

Sultan Z.A. (2013) alarmed about the intentions of huge amount of FDI inflow in India, it may be market seeking. He determined the causal relationship between FDI and exports performance and found that was Unidirectional, only from exports to FDI. He concluded that the large amount of FDI inflow in India is not for efficiency oriented, but it may be taking the advantages of large growing market.

Shaikh S.A. and Hongbing Ouyang (2015) studied influence of exchange rates volatility on trade flows for India China and Pakistan and found different relationships for short run and long run. There is negative and significant relationship in short run for all three countries but in long run there is positive relationship between both variables for all three countries but not statically significant. They concluded that negative relationship of exchange rate volatility and trade flows varies from country to country.

Sharma Renu and Kaur Sandeep (2013) assessed in their study that there is a two directional causal relationship between FDI -exports, FDI- imports-exports, it means that higher amount of FDI inflow cause increase in import of technologies and then cause growth in export and thus exports cause FDI further. The authors suggest in this study to focus more on import technologies with the help of FDI in order to expand exports and acquire new technology.

Mohanty and Panda (2015) analyzed a time series data for the period 1970-71 to 2011 to establish a long run relationship trend between export growth and exchange rate volatility and after analysis they concluded that there is no trend in those two variables in long run for the time series data for 1970-71 to 2010-11.

Nelson P. (2012) concluded a positive relationship between FDI and economic growth in India. There is a unidirectional causality from economic growth to FDI. He advised to reduce tariff rates in order to increase exports through FDI, as FDI plays a vital role in economic growth.

Hussaini Nilofer (2011) found a negative correlation between FDI inflows in India and real effective exchange rates for a time series data of 1991 to 2009 and on the other hand, he claimed a strong positive correlation between FDI inflows in India and market size.

Saradhi Raveendra V. and Goel Shashank (2014) alarmed adverse impact of capital inflows in India on the competitiveness of exports as they found capital inflows in India are associated with appreciation in real exchange rates. Appreciation in REER implies loss of international trade competitiveness The available literature exposes causal relationships of several variables of economy with the FDI inflows, like causal relationships between FDI and exports, FDI and GDP, FDI and REER. etc. The present study tries to evaluate a relationship between FDI and direction of International of India keeping above literature as references.

3. OBJECTIVES OF THE STUDY:

The study is carried out to achieve following objectives:

3.1. To examine the relationship between FDI inflows and exports.

3.2. To observe the trend in India's trade balance.

4. HYPOTHESES:

Following hypotheses formed and tested to attain the objectives of study:

H_0: "There is a significant relationship between FDI Inflows and Exports."

H_1: "There is no significant relationship between FDI Inflows and Exports."

5. RESEARCH METHODOLOGY:

The present study adopted following research methodology:

Data Type: The data used in this study are of secondary type only.

Data Collection: Data collected from the official websites of Reserve Bank of India, Ministry of Commerce and Directorate General of Commercial Intelligence & Statistics. Time series of FDI inflows and exports (Non-Oil) since 1990-1991 are used for the data analysis.

Period of Study: Study covers the span of 1990-91 to 2021-22. Total observations are 32.

Data Analysis: Data is collected and recorded in MS excel for editing and further processed in EViews-10 for analysis. Augmented Dickey Fuller (ADF) test for unit root testing, Johnsen's Cointegration test and Vector Error Correction Model (VECM) is applied to determine the long run and short run relationship between both the variables

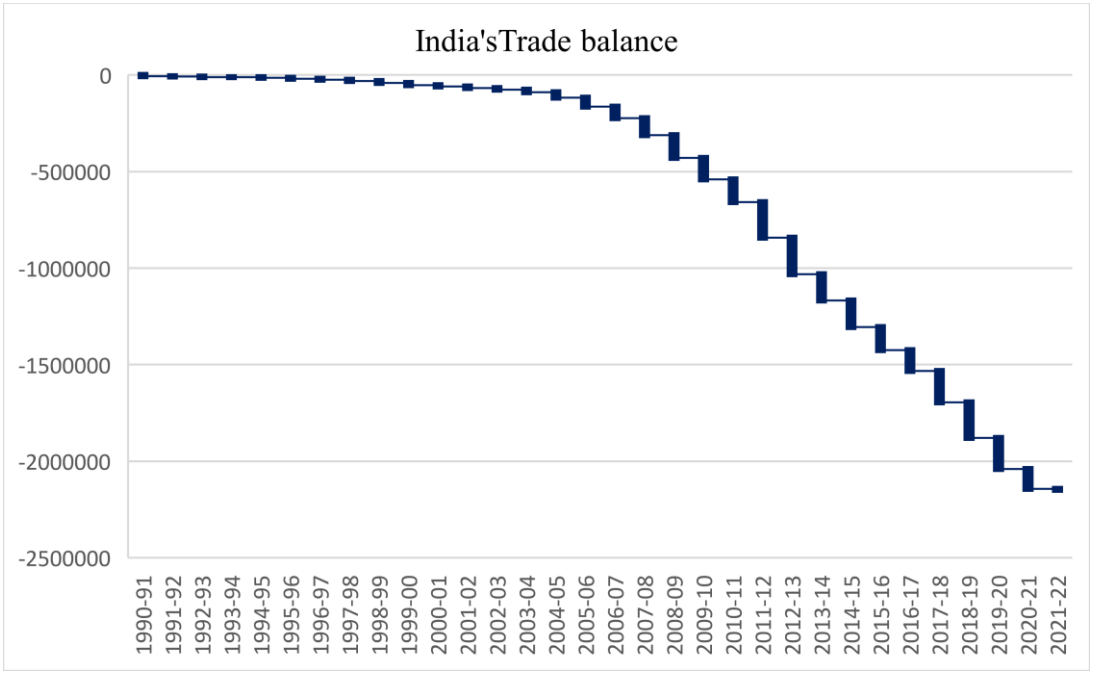
6. FINDINGS:

Findings of the present study are as follows:

6.1.India's Trade balance since 1990-1991:

India's overall exports (Merchandise and Services) in April-December 2022 are estimated to show a positive growth of 16.11% as compared to the last year (April-December 2021). As India's home demand has stayed stable amidst the global breakdown, overall imports in April-December 2022 are estimated to exhibit a progress of 25.55 % as compared to the last year. India's overall export (Goods and Services) was USD 61.82 Billion in December 2022. The exports show an undesirable advance of (-) 5.26 % as compared to the last year. Overall import in December 2022 is estimated to be USD 73.80 Billion, showing a negative growth of (-) 1.95 % as compared to the last year.

Figure 3- Trade balance of India since 1990-1991

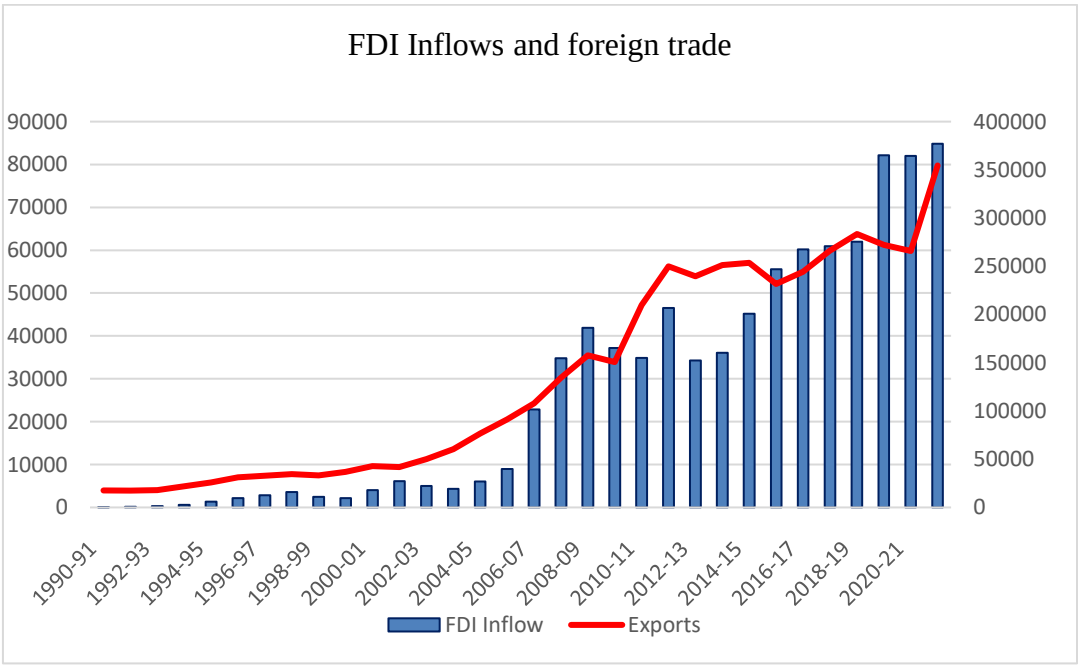


Source: compiled from data available at 'www.rbi.org.in'

6.2.Relation between FDI Inflows and Exports:

As the figure 4 exhibits, there seems a positive relationship between both the variables over the time since 1990-1991 but it is mandatory to verify the aforesaid assumption by empirical method.

Figure 4- Trend in FDI Inflow Trade balance of India since 1990-1991



Source: 'dpiit.gov.in/publications/fdi-statistics and rbi.co.in'

6.3.Unit Root Test:

Most of the time series are not stationary at level values that is why it is necessary to check their stationarity at level values. Augmented Dickey Fuller test was applied on both of the time series i.e. exports and FDI and found that both the variables are not stationary at level values but at first difference both the series are found to be stationary. Table 1 (a) and (b) shows the unit root test statistics at first difference for exports and FDI respectively, (p value=0.0056 and 0.002).

Table 1 (a): Unit Root Test Statistics [d(exports)]

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.903055	0.0056
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

Table 1 (a): Unit Root Test Statistics [d(fdi)]

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.152866	0.0002
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

6.4. Johansen Cointegration Test

After selecting the appropriate lag length with the help of AIC (Akaike Information Criterion), Johansen Cointegration test was run to check Cointegration between exports and FDI inflows. Table 2 shows that there is one cointegrating equation and variables are cointegrated (t=15.49471, p= 0.0098)

Table 2: Johansen Cointegration Test Statistics

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.440470	19.98986	15.49471	0.0098
At most 1	0.082103	2.570104	3.841466	0.1089

6.5. Vector Error Correction Model

A vector error correction model (equation i) is developed to estimate ECT and short run relationship between exports and FDI. ECT is error correction term.

$\Delta exports_t = \beta_0 + \sum_{i=1}^{n} \beta_1 \Delta export_{t-1} + \sum_{i=0}^{n} \delta_i \Delta fdi_{t-1} + \Phi Z_{t-1} + \mu_1$…….. (i)

$Z_{t-1} = ECT_{t-1} = exports_{t-1} - \beta_0 - \beta_1 fdi_{t-1}$…… (ii)

Table 3 shows the Cointegration equation and error correction terms. Negative sign of coefficient of fdi (-1) in the Cointegration equation tells the positive impact of FDI on the target variable in the long run.

Table 3: Cointegration equation and Vector Error Correction Statistics

Cointegration Eq:	CointEq1	
exports(-1)	1.000000	
fdi(-1)	-4.582583 (0.33308) [-13.7582]	
β_0	-10970.60	
Error Correction:	**D(exports)**	**D(fdi)**
CointEq1	-0.360159 (0.08638) [-4.16931]	0.025468 (0.03256) [0.78222]
D(exports(-1))	0.332993 (0.21280) [1.56485]	0.042210 (0.08020) [0.52627]
D(fdi(-1))	-2.119231 (0.58814) [-3.60325]	0.101357 (0.22168) [0.45723]
β_0	14262.90 (3721.66) [3.83240]	2197.438 (1402.74) [1.56654]

Statistics in table 3 are written in the form of equation as :

$D(exports) = C(1) * (exports(-1) - 4.58258289886 * fdi(-1) - 10970.5976423) + C(2) * D(exports(-1)) + C(3) * D(fdi(-1)) + C(4)$…… (iii)

Least square regression statistics for the equation (iii), show that the coefficient are statistically significant for C(1) and C(3) as the p values found less than 0.05.

Table 4: Least square statistics for equation (iii)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.360159	0.086383	-4.169309	0.0003
C(3)	-2.119231	0.588144	-3.603250	0.0013
C(4)	14262.90	3721.659	3.832402	0.0007

Dependent variable: d(export)

6.6.Residual Statistics:

Since the feasibility of the VECM residuals must be normally distributed and free from heteroscedasticity therefore a joint VEC residual test was applied (Table 5). P value is greater than 0.05 for the joint test, so null hypothesis cannot be rejected i.e. "There is no heteroscedasticity in residuals".

Table 5: VEC Residual Heteroscedasticity Test

Chi-sq	df	Prob.
24.73264	18	0.1325

7. CONCLUSION:

However, foreign investment brings a lot of benefits and opportunities to a country in terms of job creation, resource facilitation, etc. India being an attractive destination for foreign investors and having high potential of development prospectus can derive lot of benefits in various sectors and can also promotes rural development. In this global environment, where everything is changing at a rapid pace, a strong and easily accessible foreign investment regime can prove to be a powerful strategy for India in setting up budding entrepreneurs and businessmen in diverse sectors across the globe. According to the above findings, the study states that FDI inflows in India since 1980-1981 has been significantly affected export performance of India in long run. FDI inflows and exports were found cointegrated in Trace and Eigenvalue tests; it means both variables cannot diverge from the equilibrium in the long run. Exports performance has been influenced by FDI inflows positively in long run. As far as short run relationship is concerned between FDI and exports, it is found bidirectional exports to FDI and FDI to Exports. The direction export to FDI may be seen as the horizontal FDI and on the other hand the direction FDI to exports may be seen as vertical FDI.

REFERENCES

1. (2022, July 14). Retrieved from pib.gov.in: https://pib.gov.in/PressReleasePage.aspx?PRID=1841477
2. (2023, March). Retrieved from dpiit.gov.in: https://dpiit.gov.in/publications/fdi-statistics
3. Barua, R. (2013). A Study on The Impact of FDI Inflows on Exports and Growth of an Economy:Evidence From The Context of Indian Economy. reserchers World Journal of Arts Science and Commerce, IV(3(1)), 124-131.
4. Data base on Indian Economy. (n.d.). Retrieved from Reserve Bank of India: rbi.org.in
5. Economic Survey. (2015-16). Retrieved from Reserve Bank of India: www.rbi.org
6. Handbook of Statistics On Indian Economy. (2021-20222). Retrieved 2015, from www.rbi.org.in: https://rbidocs.rbi.org.in/rdocs/Publications/PDFs/00HC398B27C6AFF47039ABE93049886B494.PDF
7. Hussaini, N. (2011). Economic factors and Foriegn Direct Investment in India:A correlation study. Asian Journal of Management Research, 2(1), 348-358.
8. Jayakumar, Kannan, & Anbalagan. (2014). Impact of Foriegn Direct Investment,Imports and Exports. International Reeview of Reseach in Emerging Markets and Global Economy, 1(1), 51-58.
9. Jin, W., & Zang, Q. (2012). Impact of Change in Exchange Rate on Foriegn Direct Investment:Evidence From China. Lingnan Journal of Banking Finance and Economics, 4(Academic Year Issue), Article 1.
10. Jongwanich, J. (2010). Capital Flows and Real Exchange Rates in Eerging Asian Countries. Asian Development Bank Working Paper Seies No.210.
11. K.Mathyiazgagan, M. (2005). Impact of Foriegn Direct Investment on Indian Economy:A sectoral level Analusis. ISAS Working Paper No.6.
12. Lipsy, R. E. (2004). Home-and Host-Country Effects of Foriegn Direct Investment. In Challenges to Globalisation:Analysing The Economics (pp. 333-382). National Bureau of Economic Research.
13. Mahanta, D. (2012). Impact of Foreign Direct Investment on Indian economy. Research Journal of Management Sciences, 1(2), 29-31.
14. N.Prasanna. (2010). Impact of Foriegn Direct Investment on Export Performance in India. Journal of Social Science, 24(1), 65-71.
15. Narayan, L. (2014, August). Determinants of Foriegn Direct Investment in India. International Journal of Research, 1(7), 815-823.
16. Nouira, R., Plane, P., & Sekkat, K. (2011, December). Exchange rate undervaluationand manufactured exports:A deliberate strategy? Journal of Comparative Economics, 39(4), 584-601.
17. P.Nelson. (2012). An Analysis of the Impact of Foriegn Direct Investment on the Indian Economy. International Journal of Latest Reserch in Science and Technology, 1(2), D205-D209.
18. Panda, S., & Mohanty, R. K. (2015). Effects of Exchange Rate Volatility on Exports:Evidence from India. Economics Bulletin, 35(1), 305-315.
19. RBI Monthly Bulletin. (2021-22, April). Retrieved from www.rbi.org: https://rbidocs.rbi.org.in/rdocs/Bulletin/PDFs/05ARB100414F.pdf
20. Sahu, P. (2022). Does FDI have differential impacts on exports? Evidence from developing countries. International Economics, 227-237.

21. Saradhi, V., & Goel, S. (2014). An Eperical Analysis of the Relationship Between Capital Flows and the Real Exchange Rare in India. International Journal of Applied Management and Technology, 13(1), 64--81.
22. Sharma, K. (2000). Export Growth in India:Has FDI played a role? Yale University Center Discussion Paper No.816.
23. Sharma, R., & Kaur, M. (2013). Causal Links between Foreign Direct Investments and Trade:A Comparative study between India and China. Eurasian Journal of Business and Economics, 6(11), 75-91.
24. Sultan, Z. A. (2013). A causal Relationship between FDI inflows and Export:The Case of India. Journal of Economics and Sustainable Development, 4(2).
25. Udomkerdmongkol, M., Gorg, H., & Morrissey, O. (2006). Foriegn Direct Investment and Exchange Rates:A Case Study of U.S.FDI in Emerging Countries. University of Nottingham Discussion Papers In Economics, No.06/05.
26. Xing, Y., & Pradhananga, M. (2013). "How Important is Exports And FDI For China's Economic Growth?". Tokyo: National Graduate Institute For Policy Studies. Retrieved from www.grips.ac.jp: http://www.grips.ac.jp/r-center/wp-content/uploads/13-04.pdf